3 Management Toolbox: Implementation Procedures

According to Chapter 2, the goals and objectives of the fire and fuels management program will be accomplished using eight primary tools (restated below). These tools give fire managers a variety of options when choosing the *appropriate management response* for different situations. As described in the next chapter, these tools are not assigned to particular Zones or Fire Management Units in the parks (see Chapter 4 for a complete description of Zones, Fire Management Units (FMUs) and Segments). Every Zone will allow the full spectrum of responses, however for each Zone and FMU, certain tools may be more ecologically or socially acceptable based upon that Zone's values, hazards, and risks given the time of year.

This chapter defines each tool separately and outlines how it will be implemented. Special emphasis is on the four tools that involve the presence of fire on the landscape. For these tools (#2- 5 below), there is a description of project planning (if applicable), procedures during and after the fire event, staffing needs/responsibilities, documentation/cost tracking, and special considerations. The long- term strategic planning and review process is covered in Chapter 4.

The Management Toolbox Includes:

1. **Preparedness Activities**
2. **Wildland Fire Use**
3. **Wildland Fire Suppression**
4. **Prescribed Fire**
5. **Mechanical Fuel Reduction**
6. **Public Information and Education**
7. **Monitoring**
8. **Research**

TOOL #1 – PREPAREDNESS ACTIVITIES

Definition

Preparedness includes all preplanned actions that lead to effective prevention of unwanted fires and the appropriate response to all fire ignitions. The parks work hard to "sharpen" their preparedness activities since many other tools in the toolbox depend on training, fire prevention, fire readiness, etc. Some preparedness actions happen once each year, while others are ongoing.

Training

The parks will offer the required annual safety training for all wildland firefighters who maintain a red card. At minimum, annual training will consist of an 8- hour firefighter safety refresher that must include training on fire shelter care and use. Basic firefighter training (inclusive of S-130/190) will be provided for all employees new to wildland fire. Since there are also experience and training requirements needed for all designated wildland and prescribed fire positions, the parks will offer a variety of ICS and skills- based training classes or send employees off- park to receive required training. Qualifications for all positions will conform to minimum standards established in the *Wildland and Prescribed Fire Qualifications System* publication PMS- 310- 1. More stringent qualifications may be imposed by the department, agency, or park as needed.

Training needs are determined by the parks Red Card Committee, composed of the park fire management officer, both district fire management officers, the park fuels specialist, the Arrowhead Hotshot superintendent, and fire communications center manager. The current qualification levels of employees are compared to the parks' minimum qualifications list (see Appendix R). The comparison allows the committee to develop a list of training needs. The communications center manager takes this list to the regional training officers meeting to obtain slots in training courses for park employees.

Fitness

All staff involved in firefighting will pass an annual physical fitness test and receive a physical exam as prescribed in national guidance. Fire staff, who are identified as primary firefighters, will also participate in an ongoing fitness program. The annual fitness test has potential for firefighter injury, therefore conduct of the test will follow all required procedures and safeguards.

Fire Prevention

Fire prevention is an important aspect of the parks' preparedness activities. The parks will conduct an active fire prevention program including public messages, inspections, fire use restrictions, and hazard abatement reduction around structures. This program is fully detailed in the *Wildfire Prevention Plan* (Addendum).

Additional prevention activities for the parks will consist of prevention signing, prevention messages through interpreters and staff, and prevention patrols during periods of very high to extreme fire danger. A comprehensive public information and education program is detailed in this chapter, Tool #6. In addition, fire use restrictions and area closures may be necessary. Details can be found in the *Fire Use Restrictions and Emergency Closure Plan* (Appendix M).

Fire Readiness

Fire readiness is the year- round organized inventory and assessment of equipment and personnel. The parks have developed a summary list of all preparedness activities by month. This comprehensive calendar of preparedness activities is located in the Yearly Readiness Checklist (Appendix S). As part of the readiness program all operations modules and support personnel will be assessed annually through a readiness review and inspection program. Also, mandatory pre- and post- season operations preparedness and review meetings are held each spring and fall.

Weather

The parks have six weather stations that provide daily information. One station is manual and five are Remote Automated Weather Stations (RAWS). While all 6 stations catalogue fire weather either hourly or daily, only 3 stations are used for the parks National Fire Danger Rating System (NFDRS) indices calculations. These stations are located at Cedar Grove, Park Ridge, and Ash Mountain. These three NFDRS stations will be monitored daily throughout fire season.

Stations are located at:
1. Ash Mountain (manual) – NFDRS models B, F, A [elevation 1,600 feet]
2. Park Ridge – NFDRS models G, H, U [elevation 7,540 feet]
3. Cedar Grove – NFDRS models U, G [elevation 4,720 feet]
4. Wolverton Point – NFDRS models B, F [elevation 5,240 feet]
5. Sugarloaf – NFDRS models H, U [elevation7,950 feet]
6. Rattlesnake – NFDRS models H, U [elevation 8,600 feet]

Fire Danger Determination

The parks' fire and aviation coordination center tracks NFDRS fire danger indices and plots them against historical averages. The Energy Release Component (ERC), determined using Model G from the Park Ridge station, assesses relative expected wildland fire behavior for all potential fire use ignitions. The Burning Index (BI), determined using Model B from the Ash Mountain station and Model U from the Cedar Grove station, is used to index suppression response to ignitions at lower elevations.

The parks' daily staffing levels are driven by the park- wide fire danger indices derived by combining ERC from the Park Ridge station with BI values from the Ash Mountain and Cedar Grove stations. A complete description of the process used to ascertain the park- wide fire danger and the staffing logic can be found in the *Preparedness Staffing Plan* (Appendix P).

Each weather station's catalog and associated FireFamily+ runs for the past ten years can be found in Appendix P as well. In addition, seasonal (May through October) FireFamily+ runs for

the three stations described in the preceding paragraph are posted in the coordination center along with monthly runs for the current month, as an aid to seasonal comparison of fire danger with past years. Pocket cards are also carried by park fire fighters for the same reason.

The parks will not automatically extinguish natural ignitions based upon Park Ridge ERC values in the very high or extreme category. The combination of values, hazards, and risks as identified for each FMU will determine wildland fire response. While wildland fire use is not restricted due to fire danger rating classification (very high or extreme indices), prescribed fire ignitions may be restricted.

Preparedness Staffing Plan

After daily fire weather is processed and existing and forecast fire danger conditions are determined, the park will implement preparedness staffing as appropriate. The parks' *Preparedness Staffing Plan* insures that adequate fire staff is on duty for periods of high fire danger. The plan, found in Appendix P, sets guidelines to increase or decrease daily hours worked, numbers of people on duty, etc. The plan also provides a tickler list of tasks to accomplish as fire danger rises.

In general the plan calls for the following staffing:

- Staffing Levels 1, 2, and 3: normal tours of duty and number of fire personnel.
- Staffing Level 4 and 5: the fire management officer (FMO) or his acting may authorize extended hours and increased staffing for fire crews. The program assistant will activate a preparedness account to cover the costs.
- The superintendent or FMO has the ability to raise the staffing level by one for unusual events, such as holiday weekends, that will increase the potential for wildland fire.

Staffing

All park operations modules will operate as "modules" only when they meet national standards for crew module configuration. In other words, a Type 3 engine will only operate as a Type 3 engine when it is staffed by an engine boss plus two firefighters. Such standards will exist for engines, helitack, and fuels crews. Engine and helitack configurations will follow the standards outlined in the Federal Fireline Handbook. In the absence of national standards, park fuels crews will follow park staffing guidelines.

Each of the two districts, Sequoia and Kings Canyon, are expected to be staffed by the district FMO or his/her designated duty officer each day of fire season. Similarly, the park FMO will designate an acting FMO when not available. The fire and aviation communications center will be staffed with at least one person during the burning period for all days in fire season.

Suppression Fire Response Plan

A *Suppression Fire Response Plan* has been developed for use by the parks and its cooperators (California Department of Forestry – Tulare and Fresno/Kings Units, Sequoia National Forest, and Sierra National Forest). The plan characterizes response for those lands in each of the agencies' jurisdictional areas for which shared response is beneficial. The plan is reviewed

annually and undergoes thorough revision every five years. Response levels vary based upon daily fire danger staffing level determinations.

TOOL #2 – WILDLAND FIRE USE

Definition

Wildland fire use (also referred to as *fire use*) is the management of unplanned wildland fires, such as lightning- ignited fires, to accomplish specific resource management objectives. Lightning- caused wildland fires will receive appropriate management responses that give consideration to values, hazards, and risks. Fire use projects are the preferred means for achieving resource management objectives in the Zones and FMUs where restoration and ecological values dominate considerations. If unnatural fuel loads exist, it may be necessary to use fuels management techniques initially to restore an area to a natural range of conditions before allowing a fire use project.

Wildland fire use projects will be allowed to burn within current and predicted weather/climatological parameters and associated fire behavior that ensure:

1. Fire stays within a delineated area defined in the *Wildland Fire Implementation Plan* (WFIP)
2. Vegetation changes are within an accepted ecological range of values for the affected ecosystem
3. No identifiable threat will occur to significant historic or cultural resources
4. No identifiable threat to life or private property
5. Cooperation with state or federal air quality guidelines for particulate matter.
6. Concurrence of NPS regional staff during national preparedness level 4 and NPS national staff concurrence at preparedness level 5.

Procedures to ensure the results listed above:

1. Monitor weather and associated fire danger along with climatological comparisons to historical averages and past, known fire years.
2. Monitor daily PM- 10 values at Ash Mountain air quality base station as well as installing portable air quality monitoring stations at smoke sensitive sites affected by fire use projects.
3. Complete adequate fire behavior spread predictions for all ignitions. A long- term fire behavior analyst will be used for all Stage III analyses.
4. Consult with park archeologists and natural resource managers.
5. Consult with cooperators on their fire management activity to gauge effects of total fire load on region.
6. Assign sufficient wildland firefighting resources to manage the fire use project. This includes operational and logistical resources for implementation as well as managers and decision-makers.

All fire management activities in the parks will rely on tactics that minimize resource damage while maintaining the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis developed through the parks' programmatic compliance agreement (see *Draft Programmatic Minimum Requirement / Minimum Tool {MR/MT} Compliance Agreement* in Addendum).

Superintendent approval is needed for off road use of vehicles, bulldozers, and some mechanized equipment. The Minimum Impact Suppression Techniques (MIST) are found in the parks' *Fire and Aviation Management Operations Guide* (Addendum).

Unplanned Fire: What do we do?

All wildland fires will be assessed through the appropriate level of WFIP analysis and the *appropriate management response* will be chosen. The procedures that will be followed are outlined in Chapter 4 of the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum). Assessment includes data gathering and situation analysis (i.e. internal and external values which are enhanced or require protection, management objectives, safety, climatology and weather, fuel conditions, and fire behavior). The *appropriate management response* ranges from monitoring with minimal on- the- ground disturbance to intense suppression actions on some perimeters of the fire. The response will vary from fire to fire and even along the perimeter of a fire.

Reported Fire: What do we do?

When a fire is reported, the parks will take the following actions:

- **Locate the fire**
- **Size- up and determine cause**
- **Complete a WFIP Stage I analysis** to determine the *appropriate management response* within two hours of fire confirmation.
    - Decision criteria and risk factors to consider in the Stage I analysis are outlined in Chapter 4 of the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum). Parameters requiring in- depth analysis for Sequoia and Kings Canyon often include: off- site impact of air quality, seasonal fire danger/drought and its relation to fire spread (including chances of fire spreading off- park onto other jurisdictions), wildland fire activity on neighboring lands, availability of resources, on- site impacts to cultural and natural resources, and threats to human life. If it is determined that the fire can be managed within the above constraints, then the ignition may be appropriate to manage as a fire use project.
- **Seek concurrence** from the Air District to manage the fire as a fire use project on the day the ignition is confirmed if it is a "no- burn" day.
- **Choose the *appropriate management response*** based on the previous Stage I analysis. In this example, the decision is made to manage the fire for resource benefit because the agency administrator found the potential for complexity, climatology, projected fire behavior, natural and cultural resource effects, and relative risk indicators to be acceptable.
- **Implement the *appropriate management response*** – For fire use projects this may vary from periodic aerial reconnaissance to on- scene fire monitors. If the management complexity of the fire exceeds the capabilities of local resources, the parks will manage the incident through delegation to a Fire Use Incident Management Team (see Appendix K for a delegation of authority example).
- **Notify the public about the chosen management response.** Use contact lists and communication methods from *Standard Operating Procedures: Fire and Fuels Information* (Addendum). In addition to regular information about project logistics, location, and

objectives, use appropriate smoke information and recommendations (see smoke talking points in the *Smoke Communication Strategy*, Appendix I).

- **Continue to reassess the fire situation** – During a fire use project the parks must perform periodic fire assessments. The superintendent must continually validate that the fire is managed appropriately and will assess if there is a need for a more detailed Stage II or III WFIP analysis, or convert the fire to a wildland fire suppression action. The frequency of the periodic fire assessment will be indicated on the signature page of the 'Periodic First Assessment' form attached to the WFIP. Signature frequency can range from daily (high complexity, high- risk fires) to weekly (low complexity, low risk fires). If the periodic assessment indicates that the fire can no longer be successfully managed for resource benefit, a Wildland Fire Situation Analysis (WFSA) will be prepared to analyze and document changes in fire management strategy. The WFSA format is also contained in the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum).
- **Manage the fire until declared out** according to monitoring intensity and frequency guidelines indicated in the WFIP. At the minimum, periodic ground or aerial reconnaissance will be used to reassess conditions and fire status. More in- depth monitoring may be necessary to ensure proper incident management if complexity or risk increases. The parks monitor for wind speed, wind direction, smoke plume rise and dispersal, temperature, humidity, fuel moisture, fire size, and fire behavior (rate of spread, direction of spread, intensity).

Post- fire: What do we do?

- **Rehabilitation** will follow Minimum Impact Suppression Tactic Guidelines as outlined in the parks *Fire and Aviation Management Operations Guide* (Addendum) if on- the- ground actions are taken to check fire spread. In the event a fire covers large areas, has unnaturally severe effects on natural or cultural resources, or causes major impacts to the parks developed resources (i.e. trail system) a separate *Burned Area Emergency Rehabilitation Plan* will be developed by the Resource Management and Fire Management Offices, and approved by the superintendent.
- **Assemble monitoring data** as part of the final fire package.
- **Review incident** when deemed appropriate by fire management staff, superintendent, or fire management committee.

Staffing Needs and Responsibilities

Stage I through III analyses will be completed by district fire management officers or their designates (park fire management officer or fuels specialist staff) with input from the park fire planner or his/her designate. Additional park staff serving as subject matter experts will be involved in planning as conditions, issues, and fire location dictate. Examples include district rangers, archeologist, wildlife biologist, roads and trails supervisor, district facility manager, and fire information and education specialist. Fire complexity and risk will determine staffing needs.

The parks will allow fire use at all staffing levels (1- 5). All qualified personnel identified in the individual WFIP will be available to complete their identified tasks. The parks' fire monitors will have primary responsibility for staffing fire use fires. When the park wide Staffing Level is 3 or higher, fire monitoring crews will have a 5- minute helispot response time for fire use

assignments. Monitoring crews will be equipped so that they can leave directly from a project site without having to return to the station. If the predicted Lightning Activity Level (LAL) is 3 or higher, or if LALs of 3 or more have occurred within the last five days, fire monitors may have extended daily hours. A sixth day of work may be authorized at the discretion of the park fire management officer. The park fire management officer may authorize a seventh day of work for the monitoring crew if the predicted LAL is 4 or higher.

All fire use projects will be managed by a qualified fire use manager (FUMA). Depending upon tactical implementation needs, additional staff may be assigned to the incident. Either burn bosses or incident commanders may be used along with other required staff.

Documentation and Cost Tracking

The fire folder will contain copies of all documents as outlined in Appendix Q (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (WFIPs, WFSAs, and amendments for either), delegations of authority, monitoring data and summary reports, revalidation and certification documents, fire time reports, maps, photos, and DOI- 1202). All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DOI- 1202). All fire use projects will have an appropriate fire management accounting code.

It will be the responsibility of the district fire management officer, or his/her incident commander on the fire to ensure fire report completion. The report is a valuable tool as it provides an historical record of the fire regime for the parks. The DI- 1202 is the basic document used by the National Interagency Fire Center (NIFC) to document a fire occurrence.

Special Considerations

The RAWS station at Park Ridge will be utilized for tracking ERC values for fire use because of the long history of quality weather data collected at this upper elevation site. This data can be used in programmatic and individual fire analyses of climatological data (i.e. FireFamily+) for fire use projects. Additional RAWS units in the Sugarloaf drainage, Rattlesnake Creek in the Kern drainage, and at Wolverton Point in the East Fork Kaweah drainage are also available for aiding operational decision making.

TOOL #3 – WILDLAND FIRE SUPPRESSION

Definition

Wildland fire suppression is the management of unplanned wildland fires, including human and lightning ignited fires, to minimize detrimental resource impacts from such fires. Suppressed wildland fires will receive *appropriate management responses* that give consideration to fire values, hazards, and risks. The entire fire, or only a portion of it, may have its spread checked and extinguished dependent upon affected ecological, cultural, or social values, and hazards. It remains a park fire management goal to address the protection of values and hazards

pro- actively, thereby allowing for fire use in place of wildland fire suppression whenever possible. For example, if unnatural fuel loads exist which limit the ability to implement fire use projects, it may be necessary to use conservative fuels management techniques initially to restore an area to a natural range of conditions. Once this is done, more park areas will be able to support fire use rather than require wildland fire suppression.

All fire management activities in the parks will rely on tactics which cause a minimum amount of resource damage while maintaining minimal risk to the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis developed through the parks' programmatic compliance agreement (see *Draft Programmatic Minimum Requirement / Minimum Tool {MR/MT} Compliance Agreement* in Addendum). Superintendent approval is needed for off- road use of vehicles, bulldozers, and some mechanized equipment. The Minimum Impact Suppression Techniques (MIST) are found in the parks' *Fire and Aviation Management Operations Guide* (Addendum).

Unplanned Fire: What do we do?

All wildland fires will be assessed individually by preparing the appropriate level of a *Wildland Fire Implementation Plan* (WFIP). From this plan the *appropriate management response* will be chosen. The procedures that will be followed are outlined in Chapter 4 of the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum). Assessment includes data gathering and situation analysis (i.e. internal and external values which are enhanced or require protection, management objectives, safety, climatology and weather, fuel conditions, and fire behavior). The *appropriate management response* ranges from monitoring with minimal on- the- ground disturbance to intense suppression actions on all perimeters of the fire. The response may vary from fire to fire and even between different sections of the perimeter of a single fire.

Reported Fire: What do we do?

When a fire is reported, the parks will take the following actions:

- **Locate the fire**
- **Size- up and determine cause**
- **Complete a WFIP Stage I analysis** to determine the *appropriate management response* within two hours of fire confirmation. If potential complexity, climatology and projected fire behavior, natural and cultural resource effects, and relative risk indicators are unacceptable to the agency administrator the fire may be fully or partially suppressed (suppressed along a portion of its perimeter). If full suppression is warranted, the Stage I analysis will serve as documentation of the decision. If less than full suppression is warranted, then potential impacts and proposed mitigation measures will be outlined in the WFIP Stage II (and if needed Stage III) analysis.
- **Decision criteria and risk factors to consider** in the Stage I analysis are outlined in Chapter 4 of the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum). Parameters requiring in- depth analysis for Sequoia and Kings Canyon often include: off site impact of air quality, seasonal fire danger/drought and its relation to fire spread, availability of resources, on- site impacts to cultural and natural resources, and threats to human life. If any of these parameters suggest a high level of

complexity or risk to successful management and cannot be mitigated, then the fire is unwanted.

- **Inform** the Air District regarding suppression actions.
- **Choose the *appropriate management response*** based on the previous Stage I analysis. In this example, the decision is made to suppress the fire because the agency administrator found the potential for complexity, climatology, projected fire behavior, natural and cultural resource effects, and relative risk indicators to be unacceptable. Document the decision using the WFIP. Complexity, risk, and chosen tactical actions will determine the need for additional documentation of actions through a Stage II or III WFIP. For those actions requiring the immediate need of suppression resources, the parks' *Suppression Fire Response Plan* (Addendum) will be activated through the communications center.
- **Implement the *appropriate management response*** – The suppression response may vary from dispatching 2 firefighters or numerous crews to begin aggressive initial attack, to confining the fire to a specific drainage and monitoring its spread by aircraft. All suppression tactics will be based on current and predicted fire behavior given the hazards and associated threats to values. Minimum Impact Suppression Techniques (MIST) will be incorporated into all suppression operations.
- **Notify the public about the chosen management reponse.** Use contact lists and communication methods from *Standard Operating Procedures: Fire and Fuels Information* (Addendum). In addition to regular information about project logistics, location, and objectives, use appropriate smoke information and recommendations (see smoke talking points in the *Smoke Communication Strategy*, Appendix I).
- **Continue to reassess the fire situation** – The district fire management officer must continually validate that the fire is managed appropriately and will assess the need to complete a *Wildland Fire Situation Analysis* (WFSA). Examples of situations that may indicate the need for WFSA completion include: 1) not meeting control objectives by the end of the second burning period, 2) incrementally increasing number of resources to achieve containment objectives, and 3) unexpected fire behavior. Completed WFSAs will allow for the full range of strategic and tactical actions from full suppression on all perimeters to confinement within a drainage or area. If the fire exceeds the capabilities of in- park resources, crews and overhead will be requested from outside the parks based upon the *Suppression Fire Response Plan* developed with park cooperators (Addendum). If the management complexity of the fire exceeds the capabilities of these local resources, the parks will manage the incident through delegation to a Type II or I Incident Management Team (see Appendix K for a delegation of authority example). A separate *Logistics Plan* (Addendum) for extended attack and incidents managed by a Team can be found in the Addendum.
- **Monitor the fire until declared out** – Every fire will receive periodic assessment until declared out.

Post- fire: What do we do?

- **Rehabilitation** will follow Minimum Impact Suppression Techniques (MIST) as outlined in the parks *Fire and Aviation Management Operations Guide* (Addendum). In the event a fire covers large areas, has unnaturally severe effects on natural and/or cultural resources, or causes major impacts to the parks developed resources (i.e. trail system) a separate *Burned*

Area Emergency Rehabilitation Plan will be developed by the Resource Management and Fire Management Offices, and be approved by the superintendent.
- **Assemble monitoring data** as part of the final fire package.
- **Review incident** when deemed appropriate by fire management staff, superintendent, or fire management committee.

Staffing Needs and Responsibilities

Stage I through III WFIP analyses and WFSAs will be completed by district fire management officers or their designates (park fire management officer or fuels specialist staff) with input from the park fire planner or his/her designate. Duty officers for each district will be assigned every day during fire season ensuring appropriate, qualified command staff are available. Additional park staff serving as subject matter experts will be involved in planning as conditions, issues, and fire location dictate. Examples include: district rangers, archeologist, wildlife biologist, roads and trails supervisor, district facility manager, and the fire information and education specialist. Fire complexity and risk will determine staffing needs.

When the park wide Staffing Level is 3 or higher, fire operations modules will have a 5- minute response time for assignments. Crews will be equipped so that they can leave directly from a project site, prepared for an unsupported 24- hour assignment, without having to return to the station. If the predicted Lightning Activity Level (LAL) is 3 or higher modules may have extended daily hours at the discretion of the fire management officer. A sixth day of work may be authorized at the discretion of the park fire management officer. The hours of the modules may be extended, and a seventh day of work may be authorized by the park fire management officer if the predicted LAL is 4 or higher.

Suppressed wildland fires will be managed by qualified incident commanders with the appropriate skills given the incident's complexity.

Documentation and Cost Tracking

The fire folder will contain copies of all documents as outlined in Appendix Q (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (WFIPs, WFSAs, and amendments for either), delegations of authority, monitoring data and summary reports, revalidation and certification documents, fire time reports, maps, photos, and DI- 1202). All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI- 1202). All wildland fires will have an appropriate fire management accounting code.

It will be the responsibility of the district fire management officer, or his/her incident commander on the fire to ensure fire report completion. The report is a valuable tool as it provides an historical record of the fire regime for the parks. As such, it is important that all fires are documented using this form whether they occur within the park boundaries or park crews responded to a neighboring jurisdiction. This includes natural outs, support actions, and mutual aid responses. The DI- 1202 is the basic document used by the National Interagency Fire Center (NIFC) to document a fire occurrence.

TOOL #4 – PRESCRIBED FIRE

Definition

Prescribed fires are ignited by management to achieve resource objectives, most often a combination of ecosystem restoration or maintenance objectives and reduction of high hazard fuel loadings. These objectives are not mutually exclusive and usually all prescribed fire operations contain a mix of them. In certain areas of the parks where lightning- caused fires continue to be suppressed, prescribed fire may be used to replace these suppressed natural ignitions.

Prescribed fires must be described in a prescribed fire burn plan. The plan will contain a prescription defining goals, objectives, and treatment methods employed to achieve the objectives (Appendix O). Fuels management prescriptions are detailed in Appendix E.

Prescribed fire may also be used in concert with mechanical treatment. High hazard fuel conditions can be reduced while meeting structural objectives in areas immediately adjacent to infrastructure values or in boundary areas through a mix of mechanical treatment and prescribed fire. Mechanical treatment can be used as the primary method of reaching structural goals while prescribed fire actually removes the hazardous fuels.

Examples:

- There is a hazardous accumulation of fuels adjacent to infrastructure values that can be mitigated with the use of prescribed fire. The main objective of the burn operation would be reducing high hazard fuels with ecosystem restoration as a secondary consideration.
- There is a drainage that requires restoration of the ecological fire process. There are no infrastructure values or boundary issues. The main objective of the burn would be restoration of ecological processes. The secondary objective would be reducing high hazard fuels.
- There is a drainage that has been prescribed burned for ecosystem restoration. For a variety of reasons, several constraints have precluded fire use for ecosystem maintenance. The drainage has missed 1 or 2 fire return intervals and is showing signs of high hazard fuels build- up, species composition shift, and increased stand density. The main objective of the burn would be for ecosystem maintenance purposes.

Planned Treatment - Prescribed Fire: What do we do?

- **Annually update GIS data** according to fuels management accomplishments from the previous year and re- run fuels analysis.
- **Annually identify areas** that need prescribed fire and/or mechanical treatments by evaluating values, hazards, and risks for the three Zones and nine FMUs. The parks geographic information system (GIS) is the primary data storage and analysis system employed to achieve this goal. Where appropriate, treatment across agency boundaries is encouraged and facilitated. This work is an outgrowth of efforts to develop GIS data layers by watershed boundaries across agency jurisdictional boundaries.

- **Select treatment priorities** based upon the analysis of the values, hazards, and risks. Consider managerial capabilities to accomplish treatments given practical limitations in planning, finance, and logistical support. Park prescribed fire targets may be adjusted to plan for no more than two prescribed fire projects per year per fire management unit, while also attempting to limit project duration to no more than 14 days per burn. In addition, wildland fire use or suppression fires which burn park acreage (over 100 acres) in a fire management unit will factor into the decision to implement planned prescribed fire ignitions in the same fire management unit that year.
- **Write the annual fuels treatment plan** that describes the program for the up- coming field season including descriptions of individual segment preparation and execution needs. Insert this annual plan into a revised 5- *Year Fuels Treatment Plan*. This document is completed each spring following consultation with the district management teams, fire management committee review and concurrence, and superintendent approval.
- **Distribute the *Fuels Treatment Plan*** to park staff and cooperators.
- **Submit the *Fuels Treatment Plan* to the Air District for review**. Note that air quality regulations and requirements are dynamic and subject to change. The process described below is in effect at the time of this document's publication. Updated procedures and requirements enacted after the approval date of this plan will be incorporated in annual updates to the *Fire and Fuels Management Plan*. While the District does not have authority to approve or reject this overall *Fuels Management Plan*, it does provide input to the individual prescribed fire burn plan. Air quality concerns remain the major issue affecting prescribed fire treatment.
- **Assign burn bosses to individual treatment segments.** Each burn boss scouts the area so that the segment burn plan can be written and crews can begin prep work.
- **Complete burn plans** by pay period 15 each year giving the park fire management staff, chief ranger, and superintendent adequate time to address any remaining issues associated with the planned prescribed fire.
- **Submit the burn plan to the Air District for review under Rule 4106.** The Air District has up to 30 days to review the burn plan. They are required to inform the parks of concurrence or to request changes at the end of the 30- day period.
- **Request Pre- Ignition Forecasting.** No more than seven days prior to the earliest ignition date, a request will be submitted to the Air District to begin long- range smoke dispersal forecasting for the proposed ignition. The District will provide 96, 72, 48- hour outlooks, and 24- hour forecasts on days leading up to the proposed ignition date. The District retains final go/no- go authority until the time of ignition.
- **Notify the public about the annual project list**. At the beginning of fire season, notify local communities, media, businesses, agency partners, and employees about upcoming projects for the year.

Project Implementation: What do we do?

- **Notify the public about the upcoming ignition.** Use contact lists and communication methods from *Standard Operating Procedures: Fire and Fuels Information* (Addendum). In addition to regular information about project logistics, location, and objectives, use appropriate smoke information and recommendations (see smoke talking points in the *Smoke Communication Strategy*, Appendix I).

- **Monitor weather and fuels** against prescriptive criteria. Prescribed burns are ignited when weather conditions are favorable for dispersing smoke away from SSA's, or during conditions that dilute smoke so that impacts to SSA's do not exceed health standards. This will be accomplished by utilizing the most current and comprehensive weather forecasting information available for predicting smoke transport direction and concentration down wind. Fuel moisture is also a high priority prescription element that will be monitored pre- burn. Fuel moisture prescriptions are designed to provide the optimum balance between the need to moderate fire behavior, minimize undesired fire effects on other resource values, and minimize smoke production (drier fuels burn cleaner and produce less pollutants). Fuel moisture information will be obtained and analyzed pre- burn for all significant categories of fuels (litter/duff, 1- , 10- , 100- and 1000- hour fuels) to ensure conformity with the prescription.
- **Assess effects of other park fire management workload** on successful outcome for the burn. Consider the cumulative air quality effects of the upcoming project and any fire use projects (unplanned but managed ignitions) that may already be burning in the parks. If effects cannot be mitigated, postpone the planned burn.
- **Obtain superintendent go/no go decision** on ignition.
- **Seek concurrence from the Air District** to proceed with ignition.
- **Hold briefing** and review burn plan operations with burn staff.
- **Ignite a test- fire.**
- **Make final go/no go decision on ignition** (burn boss and associates).
- **Provide interpretative information** if adjacent to visitor- use area.
- **Report daily fuel treatment accomplishments** to the Air District.
- If the fire exceeds prescription criteria, **notify the superintendent of the escape and initiate a *Wildland Fire Situation Analysis* (WFSA).**

Post- fire: What do we do?

- **Rehabilitation** will follow Minimum Impact Suppression Techniques (MIST) as outlined in the parks' *Fire and Aviation Management Operations Guide* (Addendum).
- **Assemble monitoring data** as part of the final fire package.
- **Review incident** when deemed appropriate by fire management staff, superintendent, or fire management committee.
- **Report final fuel treatment accomplishments** for the project to the Air District.

Staffing Needs and Responsibilities

The district fire management officers are responsible for the implementation of the annual fuels treatment program within their respective areas. They work closely with the park fuels specialist on the development of the annual program and associated 5- *Year Fuels Treatment Plan*. A team comprised of district fire management officers, the park fuels specialist, and the fire GIS specialist will meet to compose the plan. District fire management officers will take the lead for each of their districts. The park fuels specialist is responsible for consolidating both district FMOs treatment requests into one coherent park- wide plan. The fuels specialist has final say over the district FMOs regarding treatment priority determination between the districts. District fire management officers are responsible for prescribed burn plan completion.

Each burn will be staffed by an agency- certified burn boss (appropriate to the level required), as well as other staff necessary to conduct the operation safely and efficiently. Individual segment burn plans will comply with requirements described in RM- 18. Prescribed fire burning prescriptions can be found in Appendix E. Individual prescribed fire operations can last from one day to several months. Close coordination and strong communication is required between operational overhead, the fire information and education specialist, fire effects and research program staff, general park staff, local air quality control district staff, and dispatchers.

All fire management activities in the parks will rely on tactics that minimize resource damage while maintaining the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis developed through the parks' programmatic compliance agreement (see *Draft Programmatic Minimum Requirement / Minimum Tool {MR/MT} Compliance Agreement* in Addendum).

Documentation and Cost Tracking

The fire folder will contain copies of all documents as outlined in Appendix Q (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (burn plan and any amendments, smoke permit, incident action plans), monitoring data and summary reports, fire time reports, maps, photos, and DI- 1202. All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI- 1202). All prescribed fires will have an appropriate accounting code.

It will be the responsibility of the district fire management officer, or his/her burn boss on the fire to ensure fire report completion. The report is a valuable tool as it provides an historical record of the fire regime for the parks. The DI- 1202 is the basic document used by the National Interagency Fire Center (NIFC) to document a fire occurrence.

Special Considerations

Climatological weather data analysis is used to assess the probability of season ending weather events as an aid in prescribed fire planning. It is especially important to determine ignition timing for landscape scale burns with minimal control lines due to low social value effects. The closest weather station at a similar elevation often serves as the representative record.

TOOL #5 – MECHANICAL FUEL REDUCTION

Definition

Mechanical fuel reduction is the use of mechanical equipment (i.e. weed whackers, chainsaws, dozers, rubber tired skidders, chippers, etc.) to cut and remove, or prepare for burning, woody fuels. Mechanical treatments are intended to help in achieving resource management objectives, most often a combination of ecosystem restoration and reduction of high hazard fuel loading objectives. Mechanical treatments must be described in a mechanical treatment plan. The plan

will contain a prescription defining goals, objectives, and treatment methods employed to achieve the objectives (Appendix O). Fuels management prescriptions are detailed in Appendix E. Extensive mechanical treatment, outside the bounds of the companion *Environmental Assessment*, would require further environmental analysis or may be covered under the Healthy Forests Initiative Act.

Mechanical treatment may be used in concert with prescribed fire treatment. High hazard fuel conditions can be reduced while meeting structural objectives in areas immediately adjacent to infrastructure values or in boundary areas through a mix of mechanical treatment and prescribed fire. Mechanical treatment can be used as the primary method of reaching structural goals while prescribed fire actually removes the hazardous fuels.

Examples:

- Prescribed fire has been used extensively to reduce fuels and restore natural conditions in a large area uphill from a development. However, the fuels complex immediately adjacent to the structures presents significant prescribed fire control problems and the only practical method for reducing the hazardous fuels adjacent to the structures may be through the use of mechanical techniques and then prescribed burning the slash pile accumulations.
- Heavy fuels immediately adjacent to structures, if burned, would cause an unacceptable amount of large trees to be injured or killed resulting in an increase in hazard trees. Mechanical treatment is used before prescribed burning in order to reduce the potential of the burn causing future hazard trees.

Planned Treatment – Mechanical Treatment: What do we do?

- **Annually update GIS data** according to fuels management accomplishments from the previous year and re- run fuels analysis.
- **Annually identify areas** that need prescribed fire and/or mechanical treatments by evaluating values, hazards, and risks for the three Zones and nine FMUs. The parks geographic information system (GIS) is the primary data storage and analysis system employed to achieve this goal. Where appropriate, treatment across agency boundaries is encouraged and facilitated. This work is an outgrowth of efforts to develop GIS data layers by watershed boundaries across agency jurisdictional boundaries.
- **Select treatment priorities** based upon the analysis of the values, hazards, and risks. Consider managerial capabilities to accomplish treatments given any limitations in planning, finance, and logistical support.
- **Write the annual fuels treatment plan** that describes the program for the up- coming field season including descriptions of individual segment preparation and execution needs. Insert this annual plan into a revised 5- *Year Fuels Treatment Plan*. This document is completed each spring following consultation with the district management teams, fire management committee review and concurrence, and superintendent approval.
- **Distribute the *Fuels Treatment Plan*** to park staff and cooperators.
- **Submit the *Fuels Treatment Plan* to the Air District for review.** For mechanical treatment work only, the Air District will not need to review plans. They would review prescribed fire plans that would be developed to treat mechanically generated fuels.

- **Assign project leaders to individual treatment segments.** Project leaders scout the area so that the segment's mechanical treatment plan can be written and crews can begin prep work. All NPS owned structures will be protected to a reasonable extent from unplanned fire events by the clearance of hazardous fuels on an annual basis. This hazard abatement work will comply with California Public Resource Code (PRC) 4290. Work will be performed by a combination of park fire crews, park residents, and maintenance groundskeeping crews. In areas where the NPS has jurisdiction over park concessionaires and private property in-holdings, the NPS will require building owners or leasers to comply with PRC 4290.
- **Complete mechanical treatment plans** by pay period 15 each year giving the park fire management staff, chief ranger, and superintendent adequate time to address any remaining issues associated with the proposed treatment.
- **Notify the public about the annual project list**. At the beginning of fire season, notify local communities, media, businesses, agency partners, and employees about upcoming projects for the year.

Project Implementation: What do we do?

- **Notify the public about the upcoming mechanical project.** Use contact lists and communication methods from *Standard Operating Procedures: Fire and Fuels Information* (Addendum).
- **Monitor vegetation/fuels** against prescriptive criteria.
- **Assess effects of other park fire management workload** on successful outcome for the project.
- **Notify the public** about the planned treatment.
- **Hold briefing** and review treatment objectives and operations with treatment staff.
- **Begin implementing project.** All projects involving treatment of fuels adjacent to structures must comply with California Public Resource Code 4290.
- **Provide interpretive information** if adjacent to visitor- use area.

Post- Project: What do we do?

- **Rehabilitation** will follow Minimum Impact Suppression Techniques (MIST) as outlined in the parks *Fire and Aviation Management Operations Guide* (Addendum). Rehabilitation will be accomplished by the end of the following field season.
- **Assemble monitoring data** as part of the final fire package.
- **Review incident** when deemed appropriate by fire management staff, superintendent, or fire management committee.

Staffing Needs and Responsibilities

The district fire management officers are responsible for the implementation of the mechanical treatment program within their respective areas. They work closely with the park fuels specialist on the development of the annual program and *5- Year Fuels Treatment Plan*. The park fuels specialist is responsible for consolidating both district FMOs treatment requests into one coherent park- wide plan. The fuels specialist has final say over the district FMOs regarding treatment priority determination between the districts. Mechanical hazard fuels abatement standards can be found in Appendix E.

All fire and fuels management activities in the parks will rely on tactics that minimize resource damage while maintaining the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis developed through the parks' programmatic compliance agreement (see *Draft Programmatic Minimum Requirement / Minimum Tool {MR/MT} Compliance Agreement* in Addendum).

Documentation and Cost Tracking

The project folder will contain copies of all documents as outlined in Appendix Q (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (treatment plan and any amendments, incident action plans), monitoring data and summary reports, personnel time reports, maps, photos, and fuels accomplishment summary reports. All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI- 1202). All projects will have an appropriate accounting code.

It will be the responsibility of the district fire management officer, or his/her project leader to ensure treatment report completion. The report is a valuable tool as it provides an historical record of the fuels treatment history for the parks. At this time DI- 1202's can not be completed for mechanical treatments. They are only completed for projects involving fire occurrence. Fuels accomplishment reports must be input into the Shared Application Computer System (SACS) for budgetary tracking in FIREPRO.

Special Considerations

Slash fuels that are derived from mechanical treatments and hazard tree removal operations can be burned for disposal purposes. Slash piles that are on NPS lands will be burned by NPS fire personnel and adhere to prescribed fire guidelines whenever the burning is classified by fire management staff as a prescribed fire. Slash piles on private lands will be burned by the property owners, or their agents, through a permit process. Property owners need to submit the form, "Permit for Burning Slash Piles" (Appendix N), through respective district fire management officers for approval by the park superintendent. Contractors working on NPS lands can also use this permit process for disposal of slash piles they generate.

District fire management officers are responsible for the coordination of burning slash piles on NPS lands and overseeing the permit process for slash piles that are burned on private property within park boundaries. Slash pile burning operations will comply with RM- 18. Slash produced from mechanical projects may also be chipped in place, or chipped and hauled away from the site as indicated in the individual treatment plans.

TOOL #6 – PUBLIC INFORMATION AND EDUCATION

Goals

Sequoia and Kings Canyon National Parks are dedicated to providing high- quality fire *information and education* for identified target audiences (see list below). Based on the ecological principles and operational procedures outlined in this *Fire and Fuels Management Plan*, the Fire Information and Education (FI&E) Program has four goals:

GOAL #1	Offer year- round education on fire ecology, fire history, and fire effects in the southern Sierra. Communicate how fire and fuels management practices meet natural resource management goals and thus the mission of the National Park Service.
GOAL #2	Provide accurate and timely incident information for local, regional, and national fire operations as needed.
GOAL #3	Work with local communities, park residents, and park permitees to promote fire safety, fire prevention, defensible space, firewise community planning, and fuels management.
GOAL #4	Build and maintain interagency, educational, and community partnerships to improve fire education activities.

The FI&E Program will emphasize the major goals of the *Fire and Fuels Management Plan* to increase public awareness and support. While there are a variety of management tools used in the parks, the fire program's overarching mission is to benefit park resources and society by restoring and maintaining the natural fire regime. The FI&E program will focus on this mission and will avoid dividing the program into small parts and isolating individual tools. For example, the parks will not interpret the concepts of prescribed fire separate from wildland fire use, suppression, mechanical treatment, preparedness, research, monitoring, or education since it is the combination of all eight tools that supports the parks' program.

Similarly, the FI&E Program will provide target audiences with unique information based on data specific to these parks. Park visitors and neighbors of Sequoia and Kings Canyon want to connect with these parks and the fire story here, not just with generic messages about fire ecology nationwide. The parks will generate interpretive stories for the public while maintaining a level of sophistication appropriate to the topics of fire ecology, fire history, research, monitoring, operations, safety, and fire prevention.

The Fire Communications and Education National Program Lead, stationed at the National Interagency Fire Center (NIFC), prepared the first draft *National Fire Communications Strategy* for the National Park Service in 2002. Sequoia and Kings Canyon National Parks contributed to that document's development by attending the first *Fire Connections Workshop* in November 2001. After additional input in the second *Fire Connections Workshop* in February 2003, an interdisciplinary committee will update the national strategy. The FI&E Program outlined here, while tailored for the local area, complements the national strategy in its goals, target audiences, communication methods, and evaluation.

Other Important Fire Information References

While this document provides the philosophy and general direction for the FI&E Program, there are two other important references for fire information work. Specific operational procedures (checklists, fax numbers, email lists, community contacts, etc.) are outlined in *Standard Operating Procedures: Fire and Fuels Information* (Addendum). The *Smoke Communication Strategy* (Appendix I) provides direction for communicating issues related to smoke management.

Staffing

The Fire Information and Education Specialist (in this document referred to as the FIO) is responsible for coordinating the FI&E Program. The success of this program depends on the cooperation and participation of many different partners: Interpretation, Natural Resources, Maintenance, Administration, Fire and Visitor Management, United States Geological Survey (USGS), Sequoia Natural History Association (SNHA), concession employees, and volunteers.

The FIO will serve as the liaison between these different groups to ensure the transfer of information and the consistency of content. When large incidents occur in the parks, the FIO will recruit personnel for specific duties or outside resources will be requested through dispatch procedures. The parks' Public Information Officer (PIO) may perform coordination duties when the FIO is unavailable.

Target Audiences

The parks have identified six target audiences for fire information and education messages:

1. **Park Visitors** (including in- park visitors, internet visitors, and special groups)
2. **Park Employees** (including NPS, SNHA, USGS, concessions, and volunteers)
3. **Local Communities** (including residents, businesses inside or near the parks, civic groups, and clubs)
4. **Students/Teachers** (including K- 12 students, college students, elder hostel groups, and teachers)
5. **Scientific/Professional Peers** (including other federal, state, and county agencies, and professional associations)
6. **Media*** (including print, television, radio, and film)
   (* While media is a valuable communication method, it is listed as a target audience due to the amount of time and energy that goes into facilitating interviews, film projects, etc.)

Communication Methods

The following methods will be used to communicate with the six target audiences listed above. There are both personal and non- personal methods which will facilitate reaching the greatest number of people. Table 3- 1 matches these communication methods with the appropriate target audiences. The parks will continue to improve and expand this list.

Personal

1. **Interpretive Programs** – Park staff will integrate fire messages into hikes, walks, campfire programs, and special off- site presentations. The FIO will audit these programs to ensure content quality.
2. **Education Programs** – Park staff will incorporate fire ecology concepts into curriculum- based education programs, student field research experiences, and in-class programs.
3. **Employee Training** – The FIO will coordinate park- wide employee training sessions to improve staff understanding of the fire and fuels management program. These sessions will be open to NPS, USGS, SNHA, concessions, and volunteers.
4. **Roving** – During fire operations, park employees will be stationed in high- use visitor areas, including trails, to answer questions about the current activity and/or explain the fire and fuels management program. Backcountry rangers will also provide information to backpackers about fire operations in their area.
5. **Conference Presentations** – Park staff will give peer presentations at conferences about current fire research, planning, or operations. These presentations will share information, generate feedback, and ultimately improve the parks' fire and fuels management program.
6. **Special Events** – The parks will, when possible, participate in local events to promote the fire and fuels program. For example, park employees can staff booths at local fairs or host community meetings.
7. **Public Meetings** – As needed, the parks will conduct special public meetings related to a specific fire event, planning effort, or to share general program information.
8. **Teacher Workshops** – With the help of interagency and educational partners, park staff will offer teacher workshops that incorporate fire ecology and management issues.
9. **Media Interviews** – The FIO, or park representative, will complete in- person or phone interviews for print, radio, and television outlets. When necessary, the FIO will facilitate special media projects (books, documentaries, etc.) by guiding research, scheduling interviews with park staff, and coordinating filming schedules.
10. **Recorded Phone Message** – The FIO will maintain the recorded "Fire Information" message on the main park answering system accessed by calling (559) 565- 3341.

Non- Personal

1. **Press Releases / Updates** – The FIO will use email, fax, and bulletin boards to distribute press releases / updates for all target audiences as needed.
2. **Publications** – The parks will include fire and fuels information in regular park publications (like the park newspaper). The FIO will research, write, and design additional handouts specifically about fire and fuels management such as newspapers, student materials, and brochures.
3. **Visitor Center Exhibits, Waysides, and Bulletin Boards** – The parks will maintain and update the interpretive information in visitor centers and wayside exhibits on fire and fuels management. The FIO will maintain permanent and non- permanent bulletin boards both inside and outside the parks.
4. **Community Newsletter** – The FIO will write, design, print, and send an annual community newsletter for park neighbors. The newsletter will coincide with the beginning of fire season and will give residents information about upcoming projects and events.

5. **Webpage** – The parks will maintain a fire and fuels management webpage that is linked to the main park webpage, with press releases, fire restrictions, project lists, smoke information, fire planning documents, research papers, GIS maps, interpretive information, and photos.
6. **Scientific Papers** – Park researchers will publish papers in scientific journals and/or periodicals regarding new information from the parks' fire and fuels management program.

Evaluation

To maintain a successful FI&E Program, the parks will seek evaluation opportunities such as visitor /resident / employee surveys. The parks have completed two such formal surveys in the past to assess public support and awareness of fire operations: park visitors (Quinn 1988) and local residents of Three Rivers, California (Schissler Associates 1999). In 2003, the Fire Communications and Education National Program Lead at the National Interagency Fire Center conducted an informal evaluation of the FI&E program by targeting Fire Education Specialists, their supervisors, and colleagues.

The FIO will also evaluate the FI&E Program by preparing an annual report each year that documents the accomplishments by target audience. The parks will forward this annual report to the national communications program in Boise.

Table 3-1 –Target Audiences and Communication Methods

Target Audiences	Communication Methods
Park Visitors	
In-park visitors Internet visitors Special Groups	Interpretive Programs Visitor Center Exhibits and Waysides Publications Bulletin Boards Roving Media (see below) Special Events Recorded Phone Message Webpage (local and national)
Park Employees	
NPS employees SNHA employees USGS employees Concession employees Volunteers	Press Releases / Updates Employee Training Publications Webpage (local and national) Park Radio Announcements
Local Communities	
Residents Businesses inside/near the parks Civic Groups/Clubs (Three Rivers, Wilsonia, Silver City, Oriole Lake, and Mineral King cabins)	Media (see below) Community Newsletter Bulletin Boards Recorded Phone Message Public Meetings Publications Press Releases / Updates Special Events Phone calls to smoke sensitive people

Students/Teachers	
K-12 students College students Elder Hostel groups Teachers	Interpretive Programs Education Programs Teacher Workshops Webpage (local and national)
Scientific/Professional Peers	
U.S. Forest Service California Department of Forestry Bureau of Land Management Professional Associations Local Air Districts	Press Releases / Updates Conference Presentations Scientific Papers Cooperation on interagency incidents Participation in working groups
Media	
Print (newspaper, magazine, book) Television (news, documentary) Radio Film (documentary)	Press Releases / Updates Webpage (local and national) Special Events Media Interviews Field Trips Publications

TOOL #7 – MONITORING

All NPS units that implement fire use and fuels treatment activities must develop short- and long- term ***monitoring programs*** to assess accomplishments and to determine the effects of management activities on cultural and natural resources in the parks. While the fire and fuels management program is based on a broad array of scientific research that clearly illustrates the important role of fire in the parks' ecosystems (see Chapter 9), monitoring is essential to provide information about the effects of management activities.

Using feedback from ongoing monitoring results, the fire and fuels management program can adapt to changing needs with the best available information. Monitoring is essential to determine if management objectives are achieved, as well as to detect unexpected and undesired consequences of management activities. This monitoring information is especially useful because it is obtained directly from park management activities, and therefore, has direct, local application.

A *Fire and Fuels Monitoring Plan* (Appendix C) has been developed to describe current monitoring efforts and proposed needs and will be updated annually. The *Fire and Fuels Monitoring Plan* covers the four levels of fire monitoring identified in the *NPS Fire Monitoring Handbook* (NPS 2001) including environmental monitoring, fire observation, short- term effects, and long- term effects. The *NPS Fire Monitoring Handbook* provides guidelines for monitoring fire management activities to meet NPS needs. Because the *Fire and Fuels Management Plan* includes mechanical treatment as a tool for fuel and fire manipulation, the monitoring plan also includes protocols for mechanical treatment monitoring. Guidelines for monitoring mechanical treatment are preliminary, with most of the focus on short and long term monitoring, the same as for sites treated with fire.

The parks' *Fire and Fuels Monitoring Plan* applies to monitoring efforts across both spatial and temporal scales, from site- specific up to the landscape- level, and from immediate post- fire to long- term effects. For example, in areas where heavy fuels have accumulated as a result of past fire exclusion, fuels will be monitored to determine when fuel loads have been restored by fire reintroduction. In other areas where fuel and vegetation conditions have not been greatly altered by fire exclusion, or in areas that have been restored, fire frequency, severity, and season will be monitored to insure the long- term maintenance of the historic fire regime. Correspondingly, in areas where mechanical manipulation of fuels is needed (due to presence of human structures) prior to burning of woody debris piles, fuel loads will be monitored as well as vegetation change.

The plan describes the monitoring program by subject matter including weather and fire behavior, fuels, vegetation, wildlife, water, cultural resources, and fire regime. Each subject area section outlines monitoring objectives, sampling design (including specific field protocols), locations, and a schedule appropriate for each subject matter area (Appendix C). Monitoring protocols are reviewed at the regional office level to insure that methods are appropriate and funding for monitoring is adequate.

Information from other monitoring efforts will be used to inform the fire and fuels management program where pertinent. For example, results from the parks' Inventory and Monitoring Network Program may be useful to assess the changes occurring in areas of the parks affected by wildland fires and areas where fire has been excluded for long periods.

TOOL #8 – RESEARCH

Natural science ***research*** is and will continue to be an important activity in these parks. It serves two primary purposes in relation to the fire and fuels management program. First, it helps to define both natural fire regimes as well as the range of natural conditions that serve as ecological foundations for the application of fire in park ecosystems. Second, it is used as a tool to evaluate actions used to restore and/or perpetuate desired conditions as contemplated in the policies for management of natural areas in the National Park Service. This research can have either tactical or strategic applications. Such research will continue to be encouraged and supported in an effort to further improve the parks' fire and fuels management program.

Considerable fire research has been carried out in Sequoia and Kings Canyon National Parks over the past several decades. This work has included a variety of studies in: sequoia- mixed conifer forests (Kilgore 1972, Kilgore and Taylor 1979, Parsons and DeBenedetti 1979, Harvey and others 1980, Stephenson and others 1991; Swetnam and others 1992, 1998; Swetnam 1993; Mutch 1994; Caprio and Swetnam 1995; Stephenson 1994; Miller and Urban 1999, 2000); low elevation foothill communities (Rundel and Parsons 1979, Parsons 1981, Rundel and others 1987); and high elevation forests and meadows (Vankat 1970; Kilgore 1971, DeBenedetti and Parsons 1984; Pitcher 1981, 1987).

These studies provided a firm justification and basis for the development of the parks'

prescribed and fire use management programs (Bancroft and others 1985). While much is known from these studies, in most cases they have not provided the full level of detail necessary to completely understand natural fire regimes or the long- term effects of variable intensity fires on subtle ecosystem properties.

Research needs and priorities are jointly identified by the Division of Natural Resources and the USGS Sequoia and Kings Canyon Field Station located within the parks. They are documented in the parks' *Natural and Cultural Resources Management Plan* and updated annually. Such research may include in- house studies, interagency or cooperative agreements, contracts, or independent investigations. All fire related research is closely coordinated with fire and fuels treatment operations and fire and fuels monitoring efforts in order to assure maximum application of findings to both the management and interpretation programs. During winter months, fire managers and researchers meet monthly to coordinate future projects and incorporate past research results into the next annual fuels treatment plan. A fire research coordinator within the Division of Natural Resources assists in coordinating these efforts. A report is produced annually documenting all fire- related research, monitoring, and inventory projects undertaken within a given year.

Most fire research is carried out in close conjunction with the prescribed burning program, utilizing planned burns to the extent possible. On occasion, burns will be carried out specifically to support approved research projects. These might include efforts to study the effects of variable intensity burns, reburns, or burns carried out under specific climatic or prescription variables (e.g. severe drought).

For more detailed information concerning the *Fire and Fuels Research Plan*, see Appendix D.